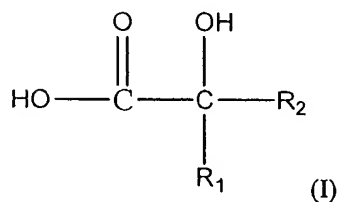


What is claimed is:

1. A composition comprising a single-phase liquid or gel comprising nitrous acid and an alpha hydroxyl acid or phosphoric acid, wherein:
 - (a) the pH of the composition either remains relatively constant at an initial value of around 3.75 or lower, or decreases from said initial value of around 3.75 or lower at the time of formulation to a value as low as around 2.5 over a period of at least about two days, preferably about two days to five days;
 - (b) the molar percentage of nitrite ion in the composition in the form of nitrous acid is greater than about 35% but less than about 95% of the total nitrite ions present in the composition; and
 - (c) the composition exhibits cidal activity against microorganisms for a period of at least two months after formulation.
2. A composition of claim 1, wherein the composition comprises a compound comprising an amount of phosphoric acid with a pKa of about 2.15 that is sufficient to lower the pH of the composition to less than about 3.75.
3. A composition of claim 1, wherein the alpha hydroxyl acid is a compound of the formula (I):



wherein R_1^1 and R_2^2 may be the same or different and may be selected from the group consisting of hydrogen, methyl, $-\text{CH}_2\text{COOH}$, $-\text{CH}_2\text{COO}^-$, $-\text{CH}_2\text{OH}$, $-\text{CHOHCOOH}$, $-\text{C}_6\text{H}_5$, and $-\text{CH}_2\text{C}_6\text{H}_5$.

4. A composition of claim 1, wherein the composition further comprises one or more of the following: a surface active material, a chelating agent, an effervescent compound, and a thickener.
5. A composition of claim 1, wherein the cidal activity of the composition over a period of about twenty-four months or more after formulation is comparable to the activity that it demonstrated initially.

6. A composition of claim 1, wherein the cidal activity of the composition over a period of about five minutes or more after formulation is equivalent to the activity necessary to achieve an approximately eight log decrease in a sample of *E. coli*.
7. A composition of claim 1, wherein the composition is used in conjunction with an application medium.
8. A composition of claim 1, wherein the nitrous acid is generated by a metal nitrite.
9. A composition of claim 1, wherein the composition is a liquid teat dip.
10. A composition of claim 1, wherein the composition is a gel.
11. A method comprising disinfecting a substrate by application of a composition of claim 1.
12. A method of claim 1, wherein the substrate is mammalian tissue.
13. A method of claim 1, wherein the substrate is a metal surface.
14. A composition of claim 1, comprising an amount of nitrite in the form of nitrous acid that is no more than about 85% by weight of the total nitrite ions in the composition.
15. A composition of claim 1, wherein the composition is a disinfecting gel comprising a thickener.
16. A composition of claim 1, wherein the composition is an oral rinse.
17. A method comprising maintaining disinfection of a substrate over a period of at least around several months by applying an effective amount of a composition of claim 1 to the substrate.
18. A method of claim 17, wherein the substrate is mammalian tissue.
19. A method of claim 17, wherein the substrate is a metal surface.
20. A composition of claim 1, wherein the composition may be sprayed onto a substrate.